CCG-C-22-13575

PHASE II REPORT

FOR 'THE GROVE', OPENSHAW, MANCHESTER

MARCH 2023



Prepared by:

CC GEOTECHNICAL LIMITED

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Prepared for:

JPJ INVESTMENT PROPERTY LIMITED

DOCUMENT CONTROL FORM	
Client:	JPJ Investment Property Limited
Project Title:	PHASE II Ground Investigation for site at 'The Grove', Openshaw, Manchester
Reference Number:	CCG-C-22-13575
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Signature	
For and behalf of CC GEOTECHNICAL LTD	
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1.0 INTRODUCTION

CC GEOTECHNICAL LIMITED (CCG) is providing consultancy services to ***JPJ INVESTMENT PROPERTY LIMITED*** (the Client) in connection with the proposed redevelopment of a parcel of land located at the intersection of Club Street and Ashton Old Road, Openshaw, Manchester, M11 1GR.

The purpose of the ground investigation was to provide geotechnical information relevant to the selection and design of foundations for a terrace of 3nr 3-storey dwellings, each constructed in traditional brick elevations under pitched roofs, each with private front and rear gardens. The development will incorporate paved parking for 2nr vehicles. Plans of the proposed developments are provided in Appendix A.

This report should be read in conjunction with the previously submitted ***CCG*** phase I report titled 'Phase I Desk Study Report for 'The Grove', Openshaw, Manchester' dated January 2023.

It must be borne in mind that the data and opinions contained in this report should be read in conjunction with the Notes on Limitations, given in Appendix F.

2.0 SITE LOCATION

The site is located at the intersection of Club Street and Ashton Old Road, Openshaw, Manchester, M11 1GR. It is situated in a mixed commercial and residential context, as shown on ***CCG*** Site Location Map No. CCG-C-22-13575-01 contained in Appendix A.

The Ordnance Survey coordinates for the approximate site centre are 389917E, 397354N.

The area of interest in which the investigation was undertaken is delineated on Drawing CCG-C-22-13575-02. It comprises a recently demolished public house and the immediately adjoining land.

3.0 DOCUMENTED GEOLOGY

The natural geology prevailing at the site was researched by reference to BGS records. These indicate that the drift deposits underlying the site comprise of Devensian Till deposits consisting of clay, silt and sand. The solid geology is documented as the Collyhurst Sandstone Formation.

4.0 FIELDWORK

An inspection of the site was made during the demolition phase. The foundations of the former public house were observed to bear directly on grey clay at around 1.5mbgl. All foundation and basement walls were grubbed out and the site left at street level with a covering of made ground.

The investigation fieldwork was carried out in accordance with BS10175: 2013 and BS5930: 2015, insofar as they related to the scope of the investigation. The investigation was scheduled to consist of the sinking of 3nr cable percussion boreholes, and the excavation of 5nr trial pits, 2 of which would be utilised for soakaway tests. However due to the onsite surface ground conditions following the recent demolition works with weak uncompacted ground, the scope of the investigation was modified to the sinking of 3nr cable percussion boreholes, positioned where the ground was capable of supporting the boring plant. Falling head permeability tests were performed in each borehole in lieu of BRE soakaway pits.

A layout of the investigation is shown on ***CCG*** Site Investigation Layout Plan No. CCG-C-22-13575-03 in Appendix A.

Borehole logs annotated with sampling details, and SPT `N` values are presented in Appendix B.

5.0 OBSERVED STRATIGRAPHY

The stratigraphy observed within the boreholes was consistent with the documented geology.

Each borehole commenced in made ground deposits generated by the recent demolition works, these deposits comprising of gravels of brick and concrete in a matrix of clay, with rare inclusions of coal and plastic remnants.

Below the made ground, the succession continued in natural deposits of grey silty clay observed to be soft to firm, as evidenced by the SPT `N` values in the range 5-8. At around 3mbgl a distinct colour change from grey to brown clay is observed and the deposit increases in strength with SPT`N` values in the range 8-18. At around 4.5-5mbgl the clay becomes grey again and exhibits a `stiff to very stiff` consistency wit SPT`N` values rising from around 15 to >50 at the termination depth of 12mbgl.

6.0 GROUNDWATER

Groundwater was not encountered within the 12m depth of borehole sinking. Some rainwater accumulations will have occurred at the interface of made ground and clay and this will have seeped into standpipes as recorded in the monitoring events.

7.0 FALLING HEAD PERMEABILITY TESTING

Falling Head Permeability tests were attempted in each of the boreholes within the clay stratum. Each test showed no measurable drop in water levels, conclusively indicating that soakaway drainage is not feasible on this site.

8.0 GAS & GROUNDWATER MONITORING

Standpipes were installed such that the response zones were in the superficial made ground, since the natural clay strata would clearly not transmit gases. A programme of gas monitoring of installed standpipes, comprising of 6 rounds distributed over a 3-month period has been adopted. At the time of writing 2nr visits have been carried out.

A preliminary gas risk assessment was undertaken in accordance with current UK guidelines set out in CIRCA C665 2007 "Assessing Risk Posed by Hazardous Gases to Buildings". The CIRIA risk assessment methodology uses typical maximum soil gas concentrations and worse case borehole flow rates to define a "Characteristic Situation" for the shallow gas regime.

The volumetric gas flow rate used by the risk assessment is termed "Gas Screening Value (GSV)" in the guidance and is defined below.

GSV (litres/hr) = borehole flow rate (litres/hr) x gas concentration.

There are also two stages to the assessment method proposed in CIRIA C665; compliance with a GSV Threshold Value and secondly, compliance with additional factors such as maximum permissible gas concentration. A summary of the gas monitoring data is presented in Appendix E. It can be seen that no positive detections of CH_4, or CO were recorded and the max recorded CO_2 value was 1.8%.

Onn the basis of results obtained so far, a Gas Screening Value (GSV) of CH_4 cannot be calculated due to the absence of this gas. A GSV value for CO_2 of 0.0018 litres/hr is calculated.

Based on the above data, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1. This classification does not require the adoption of remedial measures with respect to ground gas. However, it must be borne in mind that further monitoring is in hand and the final gas classification is subject to confirmation.

9.0 LABORATORY TESTING & ASSESSMENT OF DATA RE HUMAN HEALTH

The following analyses were undertaken at a UKAS / MCERTS accredited laboratory:

- Determination of pH, sulphates, metals, non-metals, PAH's, TPHCWG's, asbestos screen etc – 2nr tests

The soil analysis results are contained in Appendices C & D. When assessed against criteria applicable to the *residential land use with plant uptake* scenario, 3nr exceedances of the criteria published by LQM/CIEH S4UL's for Human Risk Assessment (2015) (CCG Licence S4UL3233) were recorded, those being of speciated TPH's, both aromatic and aliphatic, indicating a risk to future occupants.

Where hard cover is provided by buildings or pavements, then no remediation is required.

In private gardens including front gardens/landscaped areas, made ground should be removed to undisturbed natural clay deposits or to 600mm below finished garden level whichever is the lesser, & the levels restored by placement of clean imported subsoil / topsoil under a regime of validation testing.

Where made ground is left in place at 600mm below finished garden level, then a Terram 1000 geotextile, or similar, should be placed at the interface of existing ground & imported subsoil.

10.0 GEOTECHNICAL ASSESSMENT

10.1 Foundations & Ground Slabs

Trench fill foundations may be adopted bearing at not less than 2m on the natural clay deposits underlying the site. At 2mbgl an Allowable Bearing Pressure of 60kN/m^2 may be taken as the basis of trench width. At 3mbgl an Allowable Bearing Pressure of 100kN/m^2 may be taken.

As an alternative a minipiled ground beam foundation may be considered obviating the need for deep trench excavations and spoil disposal. Either bored piles or bottom driven cast insitu steel cased piles may be considered, carrying a notional 450mm x 450mm reinforced concrete ground beam off which the superstructure would be built.

A piling layout should be produced and the loadings on each pile calculated. Piling contractors should be required to provide geotechnical calculations showing the length / diameter of each pile corresponding to the calculated pile loading.

A fully suspended precast concrete floor is recommended.

10.2 Excavations

Excavations may be undertaken in the observed ground conditions by light hydraulic excavators. Excavations in excess of 1.2mbgl will require side support.

10.3 Groundwater Management

Rainwater infiltration will accumulate at the interface of made ground and natural clay, and some pumping of this will be required to provide dry conditions for foundation construction, in particular for avoidance of inflows into trench fill foundations.

APPENDIX A

DRAWINGS



Legend

Site Location

CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client:
JPJ Investment Property Limited

Project:
'The Grove', Openshaw, Manchester

Title:
Site Aerial Photography Plan

Scale:	Issue:
NTS	1
Drawn by:	Date
LT	January 2023
Project No.	Drawing No.
CCG-C-22-13575	13575-1

CC GEOTECHNICAL LIMITED



Notes:

Cable Percussive Borehole

CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client:
JPJ Investment Property Limited

Project:
'The Grove', Openshaw, Manchester

Title:
Site Investigation Location Plan

Scale:	Issue:
NTS	1
Drawn by:	Date:
LT	January 2023
Project No.	Drawing No.
CCG-C-22-13575	13575-2

CC GEOTECHNICAL LIMITED



MASTERPLAN
1 : 100

KEY:

SITE BOUNDARY LINE

HARDWORKS

TEGULA MODULAR PAVING
To building frontage + Driveways
Dimensions: 160 x 120mm - nominal joints 5mm

MACADAM
To driveways

SOFTWORKS

PROPOSED LAWN WITH PLANTING
Rolled turf laid onto minimum depth of 200mm topsoil.
Planted into minimum depth of 450mm topsoil.

LAWN
Rolled turf laid onto minimum depth of 200mm topsoil.

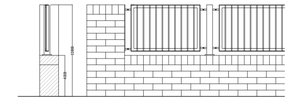
PROPOSED TREE
Planted into minimum depth of 450mm topsoil.

BOUNDARY TREATMENTS

REAR FENCING
Location - Rear
Material - Timber 1800mm Feather Edge Board Fence

RAILING
Location - Front
Material - Black painted (see below image)

LOW LEVEL WALL 488mm
Location - Front
Material - Red Brick - to match existing street scene along club street/ old ashton road)



LOW LEVEL WALL 488mm WITH RAILING

HIGH LEVEL WALL 1800mm
Location - Corner plot Club Street
Material - Red Brick - to match existing street scene along club street/ old ashton road)

BINS, RUBBISH AND RECYCLING

Bins from houses to be put out for emptying at the front of property.
Including:

1 x 140lt **Brown** Slimline Wheelie Bin

1 x 140lt **Green** Slimline Wheelie Bin

1 x 140lt **Grey** Slimline Wheelie Bin

1 x 140lt **Blue** Slimline Wheelie Bin

Blue, Brown and Green bin to be substituted for box or caddy where storage at the front of property is not sufficient.

OTHER

EV — **ELECTRIC CAR CHARGING POINT**
Location - Parking Bays

STORAGE/ BIKE SHED
Location - To rear of properties

DRIVEWAY GATE
Location - Driveways to rear of plot 01. Materials to match houses along Old Ashton Road.



HOUSE TYPES

TYPE	NUMBER	HEIGHT/ STOREY	BED/ PER	AREA GEA/ GIA
01	03	3	4B8P	130SQM/ 108SQM
TOTAL:	3			

Notes:

THE CONTENT OF THIS DRAWING IS FOR DESIGN INTENT AND REQUIRES FURTHER DESIGN DEVELOPMENT AND COORDINATION WITH ALL RELEVANT CONSULTANTS, SUB-CONTRACTORS, SPECIALIST DESIGNERS AND STATUTORY AUTHORITIES.

1 0 1 2 3 4 5
SCALE 1: 100 m

NORTH

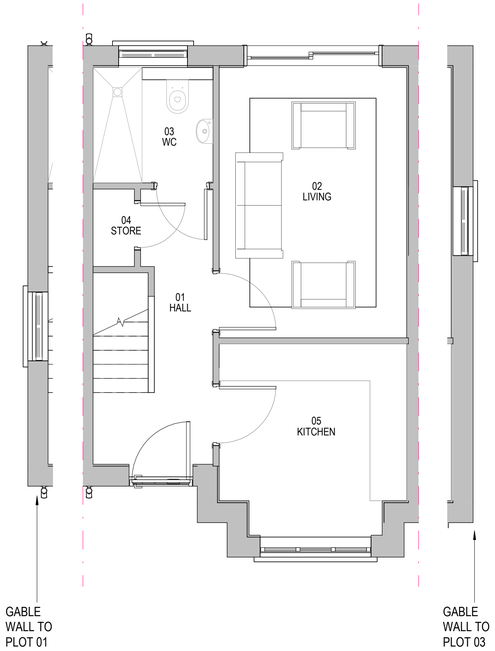
REV	DATE	REVISION NOTE	BY	CHECK
P1	24.03.22	Amended in-line with comments from CC	RM	CC

THE GROVE SITE
SITE PLAN

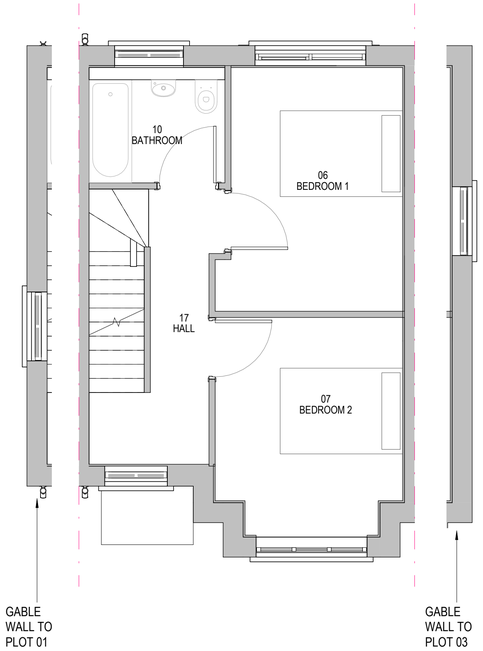
0000_ 70400 REV P1

STATUS | PLANNING
SCALE | As indicated
DRAWN BY | RM
DATE | 23.03.22

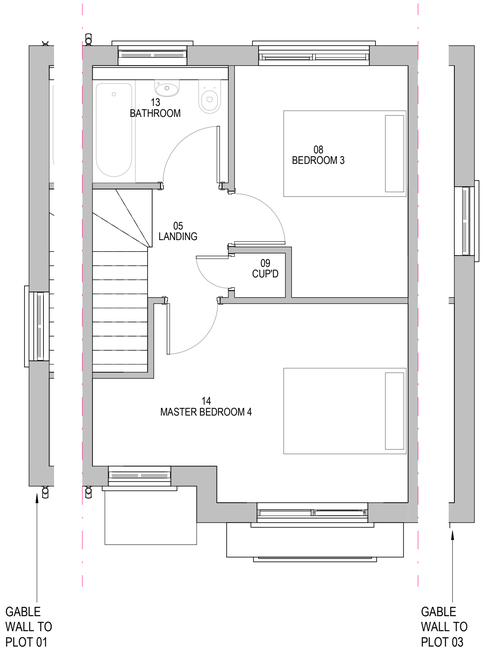
BG- EWA- ZZ- 00- DR- A- 70400



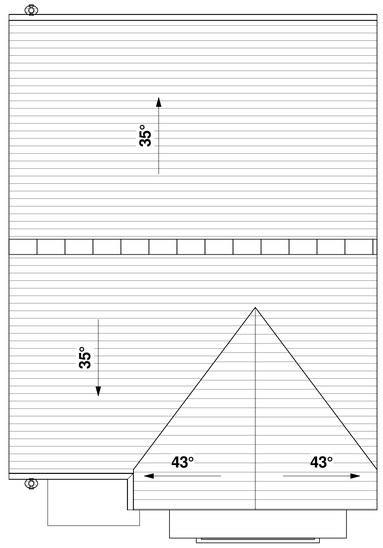
Floor Plan_Level 00



Floor Plan_Level 01



Floor Plan_Level 02



Roof Plan

Note Number	Note Text
01	SLATE ROOF
02	UPVC BLACK - WINDOWS AND DOORS
03	BUFF MULTI BRICK
04	STONE SILL & BRICK HEADER
05	BLACK SPANDREL PANEL

KEY:

01 - SLATE ROOF



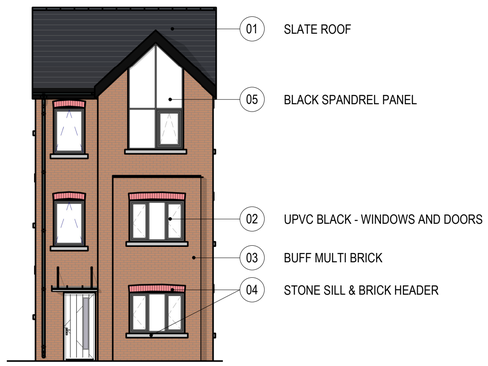
02 - UPVC BLACK - WINDOWS AND DOORS

04 - STONE SILL & BRICK HEADER

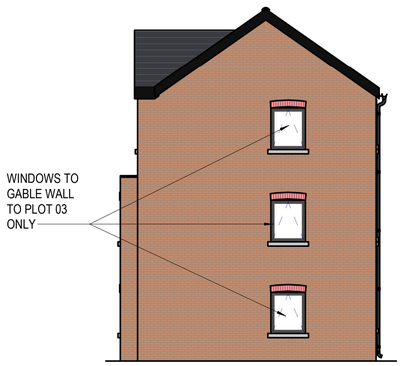


03 - BUFF MULTI BRICK

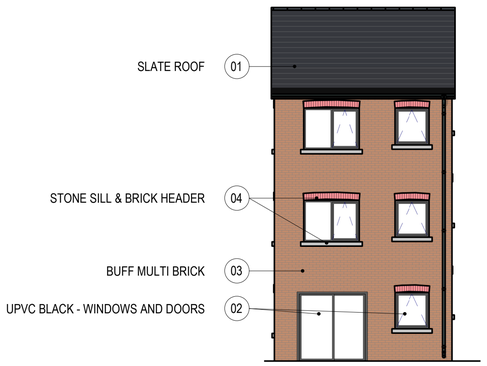




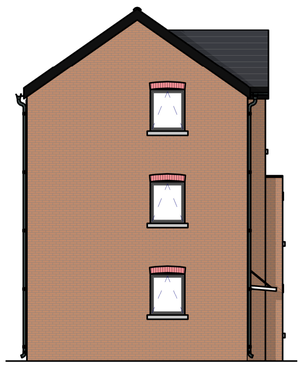
Elevation - South



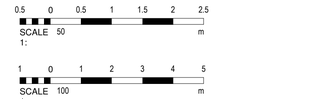
Elevation - East



Elevation - North



Elevation - West



REV	DATE	REVISION NOTE	BY	CHECK
P1	24.03.22	Amended in-line with comments from CC	RM	CC

RACHEL MCDONNELL CREATIVE

THE GROVE SITE

Proposed Floor Plans & Elevations

0000_ 10400 REV P1

STATUS | PLANNING SCALE | As indicated

DRAWN BY | RM DATE | 23.03.22

0001- RM- ZZ- ZZ- DR- A- 10400

APPENDIX B

CABLE PERCUSSION BOREHOLE LOGSHEETS

Contract Name: 'The Grove', Oppenshaw		Client: JPJ Investment Property		Borehole ID: **BH01**
Contract Number: CCG-C-22-13575	Date Started:	Logged By: LT	Checked By: CB	Status: DRAFT
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: CABLE PERCUSSIVE RIG
Rig Crew: NW/AS	Scale: 1:50			Sheet 1 of 2
Weather:	Termination: AS SCHEDULED	SPT Hammer: N/R, Energy Ratio: N/R		

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	B			(1.50)		Brown very gravelly silty CLAY. Gravel is fine to coarse sub-angular to sub-rounded brick, concrete and plastic (MADE GROUND)		
0.60	B							
1.00	B	SPT(S) 1.20m, N=4 (1,0/2,0,1,1)						
1.50	B			1.50		Firm grey silty CLAY		
		SPT(S) 2.00m, N=7 (2,4/2,1,2,2)		(1.50)				
2.50	B							
		SPT(S) 3.00m, N=17 (4,4/4,5,4,4)		3.00		Stiff brown gravelly sandy silty CLAY.		
3.50	B			(1.70)				
		SPT(S) 4.00m, N=18 (5,5/4,5,5,4)						
4.50	B			4.70		Stiff grey silty CLAY		
		SPT(S) 5.00m, N=15 (4,4/3,4,4,4)						
5.50	B							
		SPT(S) 6.00m, N=19 (4,7/4,5,5,5)						
7.00	B			(7.30)				
		SPT(S) 7.50m, N=18 (5,6/6,4,4,4)						
8.50	B							
		SPT(S) 9.00m, N=24 (7,6/5,7,6,6)						
10.00	B					Continued next sheet		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)
				0.00	0.50	PLAIN	
				0.50	5.00	SLOTTED	

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

	Contract Name: 'The Grove', Oppenshaw		Client: JPJ Investment Property		Borehole ID: **BH01**
	Contract Number: CCG-C-22-13575	Date Started:	Logged By: LT	Checked By: CB	Status: DRAFT — Sheet 2 of 2
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: CABLE PERCUSSIVE RIG	Rig Crew: NW/AS — Scale: 1:50
Weather:		Termination: AS SCHEDULED		SPT Hammer: N/R, Energy Ratio: N/R	

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						Stiff grey silty CLAY		
		SPT(S) 10.50m, N=44 (9,11/11,10,10,13)						
11.50	B							
		SPT(S) 12.00m, N=48 (11,10/9,9,14,16)		12.00		End of Borehole at 12.00m		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)
				0.00	0.50	PLAIN	
				0.50	5.00	SLOTTED	

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name: 'The Grove', Oppenshaw		Client: JPJ Investment Property		Borehole ID: **BH02**
Contract Number: CCG-C-22-13575	Date Started:	Logged By: LT	Checked By: CB	Status: DRAFT
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: CABLE PERCUSSIVE RIG
Rig Crew: NW/AS	Scale: 1:50			Sheet 1 of 2
Weather:	Termination: AS SCHEDULED	SPT Hammer: N/R, Energy Ratio: N/R		

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	B			(0.60)		Brown very gravelly silty CLAY. Gravel is fine to coarse sub-angular to sub-rounded brick, concrete and plastic (MADE GROUND)		
0.30	ES							
0.60	B			0.60		Firm grey silty CLAY		
1.00	B							
		SPT(S) 1.20m, N=6 (1,1/2,1,1,2)						
1.50	B							
				(2.50)				
		SPT(S) 2.00m, N=6 (2,2/1,2,2,1)						
2.50	B							
		SPT(S) 3.00m, N=8 (3,2/2,2,2,2)		3.10		Firm brown gravelly sandy silty CLAY.		
3.50	B							
				(1.20)				
		SPT(S) 4.00m, N=6 (1,0/2,1,1,2)						
				4.30		Stiff grey silty CLAY		
4.50	B							
		SPT(S) 5.00m, N=14 (2,4/4,3,3,4)						
5.50	B							
		SPT(S) 6.00m, N=19 (3,4/5,5,5,4)						
7.00	B			(7.70)				
		SPT(S) 7.50m, N=23 (4,5/6,6,7,4)						
8.50	B							
		SPT(S) 9.00m, N=43 (7,7/10,10,13,10)						
10.00	B					Continued next sheet		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)
				0.00	0.50	PLAIN	
				0.50	5.00	SLOTTED	

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

CCG	Contract Name: 'The Grove', Oppenshaw		Client: JPJ Investment Property		Borehole ID: **BH02**
	Contract Number: CCG-C-22-13575	Date Started:	Logged By: LT	Checked By: CB	Status: DRAFT — Sheet 2 of 2
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: CABLE PERCUSSIVE RIG	Rig Crew: NW/AS — Scale: 1:50
Weather:	Termination: AS SCHEDULED		SPT Hammer: N/R, Energy Ratio: N/R		

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
		SPT(S) 10.50m, N=61 (11,9/13,17,14,17)				Stiff grey silty CLAY		
11.50	B							
		SPT(S) 12.00m, N=86 (25 for 115mm/20,19,22,25)		12.00		End of Borehole at 12.00m		

11 12 13 14 15 16 17 18 19 20

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)
				0.00	0.50	PLAIN	
				0.50	5.00	SLOTTED	

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name: 'The Grove', Oppenshaw		Client: JPJ Investment Property		Borehole ID: **BH03**
Contract Number: CCG-C-22-13575	Date Started:	Logged By: LT	Checked By: CB	Status: DRAFT
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: CABLE PERCUSSIVE RIG
Rig Crew: NW/AS	Scale: 1:50			Sheet 1 of 2
Weather:	Termination: AS SCHEDULED	SPT Hammer: N/R, Energy Ratio: N/R		

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	B					Brown very gravelly silty CLAY. Gravel is fine to coarse sub-angular to sub-rounded brick, concrete and plastic (MADE GROUND)		
0.60	B							
0.70	ES			(1.50)				
1.00	B							
		SPT(S) 1.20m, N=4 (1,0/2,0,1,1)						
1.50	B			1.50		Firm grey silty CLAY		
		SPT(S) 2.00m, N=5 (1,1/1,0,2,2)		(1.50)				
2.50	B							
		SPT(S) 3.00m, N=8 (3,1/3,2,2,1)		3.00		Firm becoming stiff brown gravelly sandy silty CLAY.		
3.50	B							
		SPT(S) 4.00m, N=15 (4,4/5,4,3,3)		(1.70)				
4.50	B			4.70		Stiff grey silty CLAY		
		SPT(S) 5.00m, N=13 (4,4/3,3,3,4)						
5.50	U							
		SPT(S) 6.00m, N=23 (5,6/6,7,5,5)						
7.00	B			(7.30)				
		SPT(S) 7.50m, N=24 (7,4/4,7,7,6)						
8.50	U							
		SPT(S) 9.00m, N=38 (6,4/6,7,11,14)						
10.00	U					Continued next sheet		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	0.50	PLAIN	
0.50	5.00	SLOTTED	

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

	Contract Name: 'The Grove', Oppenshaw		Client: JPJ Investment Property		Borehole ID: **BH03**
	Contract Number: CCG-C-22-13575	Date Started:	Logged By: LT	Checked By: CB	Status: DRAFT — Sheet 2 of 2
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: CABLE PERCUSSIVE RIG	Rig Crew: NW/AS — Scale: 1:50
Weather:		Termination: AS SCHEDULED		SPT Hammer: N/R, Energy Ratio: N/R	

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						Stiff grey silty CLAY		
		SPT(S) 10.50m, N=62 (14,9/11,14,16,21)						
11.50	B							
		SPT(S) 12.00m, N=109 (25 for 85mm/30,27,19,33)		12.00		End of Borehole at 12.00m		

11 12 13 14 15 16 17 18 19 20

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	0.50	PLAIN	
0.50	5.00	SLOTTED	

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

APPENDIX C

CHEMICAL TEST RESULTS

Unit A2
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Ponswood Industrial Estate
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East Sussex
TN38 9BY
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2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	23-46943
Issue:	1
Date of Issue:	07/03/2023
Contact:	Liam Taylor
Customer Details:	CC Geotechnical Ltd Unit 1 & 2 Deltic Place Deltic Way Liverpool MersevsideL33 7BA
Quotation No:	Q22-03450
Order No:	CCG-C-23-13575
Customer Reference:	CCG-C-23-13575
Date Received:	27/02/2023
Date Approved:	07/03/2023
Details:	The Grove, Oppenshaw
Approved by:	

Tim Reeve, Quality Officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

This report may only be reproduced in full

Sample Summary

Report No.: 23-46943, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
313581	BH02 0.30	23/02/2023	27/02/2023	Sandy silty loam	
313582	BH03 0.70	23/02/2023	27/02/2023	Sandy silty loam	

Results Summary

Report No.: 23-46943, issue number 1

			ELAB Reference	313581	313582
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	BH02	BH03
			Sample Depth (m)	0.30	0.70
			Sampling Date	23/02/2023	23/02/2023
Determinand	**Codes**	**Units**	**LOD**		
Soil sample preparation parameters					
Moisture Content	N	%	0.1	19.7	20.6
Material removed	N	%	0.1	8.1	13.2
Description of Inert material removed	N		0	Stones	Stones/Brick
Metals					
Antimony	N	mg/kg	2.5	2.7	< 2.5
Arsenic	M	mg/kg	1	8.4	9.1
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	19.0	18.2
Copper	M	mg/kg	5	37.2	35.6
Lead	M	mg/kg	5	120	107
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Molybdenum	N	mg/kg	0.5	1.0	1.0
Nickel	M	mg/kg	5	18.3	17.9
Selenium	M	mg/kg	1	< 1.0	< 1.0
Zinc	M	mg/kg	5	116	114
Anions					
Water Soluble Sulphate	M	g/l	0.02	< 0.02	< 0.02
Inorganics					
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2
Acid Soluble Sulphate (SO4)	U	%	0.02	0.43	0.45
Water Soluble Boron	N	mg/kg	0.5	1.0	0.9
Miscellaneous					
pH	M	pH units	0.1	8.3	8.9
Soil Organic Matter	U	%	0.1	3.1	3.1
Polyaromatic hydrocarbons					
Naphthalene	SM	mg/kg	0.02	0.03	< 0.02
Acenaphthylene	SM	mg/kg	0.02	< 0.02	< 0.02
Acenaphthene	SM	mg/kg	0.02	0.02	< 0.02
Fluorene	S	mg/kg	0.02	< 0.02	< 0.02
Phenanthrene	SM	mg/kg	0.02	0.17	0.11
Anthracene	S	mg/kg	0.02	0.03	0.03
Fluoranthene	SM	mg/kg	0.02	0.34	0.15
Pyrene	SM	mg/kg	0.02	0.31	0.14
Benzo(a)anthracene	S	mg/kg	0.02	0.20	0.07
Chrysene	SM	mg/kg	0.02	0.23	0.09
Benzo(b)fluoranthene	SM	mg/kg	0.02	0.24	0.10
Benzo(k)fluoranthene	SM	mg/kg	0.03	0.10	0.03
Benzo(a)pyrene	S	mg/kg	0.02	0.21	0.08
Indeno(1,2,3-cd)pyrene	SM	mg/kg	0.02	0.15	0.06
Dibenzo(a,h)anthracene	SM	mg/kg	0.02	0.03	< 0.02
Benzo[g,h,i]perylene	SM	mg/kg	0.02	0.16	0.06
Total PAH(16)	NS	mg/kg	0.34	2.22	0.92
BTEX					
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 23-46943, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
313581	0.30	BH02	Brown Soil, Stones, Clinker, Brick, Organics	No asbestos detected	n/t	n/t	n/t	n/t
313582	0.70	BH03	Brown Soil, Stones, Clinker, Brick, Organics	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 23-46943, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Free cyanide	N	As submitted sample	28/02/2023	107	Colorimetry
Sulphide	N	As submitted sample	01/03/2023	109	Colorimetry
Hexavalent chromium	N	As submitted sample	28/02/2023	110	Colorimetry
pH	M	Air dried sample	01/03/2023	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	01/03/2023	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	28/02/2023	300	ICPMS
Water soluble anions	M	Air dried sample	28/02/2023	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	01/03/2023	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	01/03/2023	181	GC-MS
BTEX in solids	M	As submitted sample	01/03/2023	181A	GC-MS
Water soluble boron	N	Air dried sample	28/02/2023	202	Colorimetry
Asbestos identification	U	Air dried sample	02/03/2023	281	Microscopy
Soil organic matter	U	Air dried sample	01/03/2023	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited

Report Information

Report No.: 23-46943, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Unit 7-8 Hawarden Business Park
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The Environmental Laboratory Ltd
Unit A2, Windmill Road
Ponswood Industrial Estate
St. Leonards on Sea
East Sussex
TN38 9BY

Attention: Customer Services

CERTIFICATE OF ANALYSIS

Date of report Generation:	07 March 2023
Customer:	The Environmental Laboratory Ltd
Sample Delivery Group (SDG):	230301-56
Your Reference:	23-46943
Location:	Not specified
Report No:	681033
Order Number:	11036

We received 2 samples on Wednesday March 01, 2023 and 2 of these samples were scheduled for analysis which was completed on Monday March 06, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager

ALS Laboratories (UK) Limited. Registered Office: Torrington Avenue, Coventry CV4 9GU. Registered in England and Wales No. 02391955.

CERTIFICATE OF ANALYSIS

SDG: 230301-56 **Report Number:** 681033 **Superseded Report:**
Client Ref.: 23-46943 **Location:** Not specified

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
27620664	313581			22/02/2023
27620666	313582			22/02/2023

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG: 230301-56 **Report Number:** 681033 **Superseded Report:**
Client Ref.: 23-46943 **Location:** Not specified

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			27620664	27620666
Customer Sample Reference			313581	313582
AGS Reference				
Depth (m)				
Container			125g Glass Jar	125g Glass Jar
Sample Type			S	S
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2	X	X
Sample description	All	NDPs: 0 Tests: 2	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X	X
VOC MS (S)	All	NDPs: 0 Tests: 2	X	X

CERTIFICATE OF ANALYSIS

SDG: 230301-56 **Report Number:** 681033 **Superseded Report:**
Client Ref.: 23-46943 **Location:** Not specified

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
27620664	313581		Light Brown	Sandy Clay Loam	Crushed Brick	Stones
27620666	313582		Dark Brown	Sandy Clay Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG: 230301-56 **Report Number:** 681033 **Superseded Report:**
Client Ref.: 23-46943 **Location:** Not specified

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	313581	313582				
			Depth (m)	.	.				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	22/02/2023	22/02/2023				
			Sample Time	.	.				
			Date Received	01/03/2023	01/03/2023				
			SDG Ref	230301-56	230301-56				
			Lab Sample No.(s)	27620664	27620666				
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		21	22				

Validated

CERTIFICATE OF ANALYSIS

SDG: 230301-56 **Report Number:** 681033 **Superseded Report:**
Client Ref.: 23-46943 **Location:** Not specified

TPH CWG (S)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	313581	313582				
			Depth (m)	.	.				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	22/02/2023	22/02/2023				
			Sample Time	.	.				
			Date Received	01/03/2023	01/03/2023				
			SDG Ref	230301-56	230301-56				
			Lab Sample No.(s)	27620664	27620666				
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		109 2	76 2				
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/kg	TM089		<10 2	<10 2				
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/kg	TM089		<10 2	<10 2				
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/kg	TM089		<10 2	<10 2				
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #				
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #				
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #				
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1000 µg/kg	TM414		1010 #	1670 #				
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000	<1000				
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5000 µg/kg	TM414		<5000	<5000				
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10000 µg/kg	TM414		<10000	<10000				
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/kg	TM089		<10 2	<10 2				
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/kg	TM089		<10 2	<10 2				
Aromatics >EC8-EC10 (HS_1D_AR)	<10 µg/kg	TM089		<10 2	<10 2				
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #				
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #				
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #				
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1000 µg/kg	TM414		2820 #	5520 #				
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414		1260	1100				
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000	<1000				
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5000 µg/kg	TM414		<5000	7320				
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10000 µg/kg	TM414		<10000	<10000				
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<50 µg/kg	TM089		<50 2	<50 2				
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<50 µg/kg	TM089		<50 2	<50 2				
GRO >C5-C10 (HS_1D_TOTAL)	<20 µg/kg	TM089		<20 2	<20 2				

CERTIFICATE OF ANALYSIS

SDG: 230301-56 **Report Number:** 681033 **Superseded Report:**
Client Ref.: 23-46943 **Location:** Not specified

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Customer Sample Ref.			313581	313582				
Depth (m)			.	.				
Sample Type			Soil/Solid (S)	Soil/Solid (S)				
Date Sampled			22/02/2023	22/02/2023				
Sample Time			.	.				
Date Received			01/03/2023	01/03/2023				
SDG Ref			230301-56	230301-56				
Lab Sample No.(s)			27620664	27620666				
AGS Reference								
Component	**LOD/Units**	**Method**						
Dibromofluoromethane**	%	TM116	99.8 2	111 2				
Toluene-d8**	%	TM116	93.5 2	97.4 2				
4-Bromofluorobenzene**	%	TM116	79.4 2	96.2 2				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 2 M	<100 2 M				
Benzene	<9 µg/kg	TM116	<9 2 M	<90 2 M				
Toluene	<7 µg/kg	TM116	<7 2 M	<70 2 M				
Ethylbenzene	<4 µg/kg	TM116	<4 2 M	<40 2 M				
p/m-Xylene	<10 µg/kg	TM116	<10 2 #	<100 2 #				
o-Xylene	<10 µg/kg	TM116	<10 2 M	<100 2 M				
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02 2	<0.2 2				
Sum of BTEX	<40 µg/kg	TM116	<40 2	<400 2				

Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 230301-56 **Report Number:** 681033 **Superseded Report:**
Client Ref.: 23-46943 **Location:** Not specified

Test Completion Dates

Lab Sample No(s)	27620664	27620666
Customer Sample Ref.	313581	313582
AGS Ref.		
Depth		
Type	Soil/Solid (S)	Soil/Solid (S)
EPH CWG GC (S)	06-Mar-2023	06-Mar-2023
GRO by GC-FID (S)	03-Mar-2023	06-Mar-2023
Sample description	02-Mar-2023	02-Mar-2023
TPH CWG GC (S)	06-Mar-2023	06-Mar-2023
VOC MS (S)	03-Mar-2023	06-Mar-2023

SDG:	230301-56	**Report Number:**	681033	**Superseded Report:**	
Client Ref:	23-46943	**Location:**	Not specified		

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX D

CONTAMINATION ASSESSMENT WORKSHEETS

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

METALS DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-23-13575
Site name: 'The Grove', Openshaw

Prepared by: LT
Authorised by: CB
Proposed land use: Residential with plant uptake
SOM % used: 2.5

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

			Metals							
Contaminants			Cadmium	Chromium III	Chromium VI	Copper	Lead	Mercury (elemental)	Nickel	Zinc
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.5	5.0	0.8	5.0	5.0	0.5	5.0	5.0
Human Health Risk Assessment (GAC)			11	910	6	2400	200	1.2	180	3700
Sample Location	Sample Depth (m)	Sample type								
BH02	0.30	SOIL	< 0.5	**19**	< 0.8	**37.2**	**120**	< 0.5	**18.3**	**116**
BH03	0.70	SOIL	< 0.5	18.2	< 0.8	35.6	107	< 0.5	17.9	114
Human Health Risk Assessment (GAC)			11	910	6	2400	200	1.2	180	3700

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

SEMI-METALS, NON-METALS, INORGANICS AND OTHER DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-23-13575
Site name: 'The Grove', Openshaw

Prepared by: LT
Authorised by: CB
Proposed land use: Residential with plant uptake
SOM % used: 2.5

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

			Semi/non-metals			Inorganics			Other	
Contaminants			Arsenic	Boron	Selenium	Cyanide (free)	Sulphate (water soluble)	Sulphate (water soluble)	pH (units)	Soil Organic Matter %
Units			mg/kg	mg/kg	mg/kg	mg/kg	g/l	mg/l	units	units
Limit of Detection			1.0	0.5	1.0	1.0	0.02	20.0	0.1	0.1
Human Health Risk Assessment (GAC)			37	290	350	22	NA	NA	NA	NA
Sample Location	Sample Depth (m)	Sample type								
BH02	0.30	SOIL	8.4	**1**	< 1.0	< 1.0	< 0.02	n/t	8.3	**3.1**
BH03	0.70	SOIL	**9.1**	0.9	< 1.0	< 1.0	< 0.02	n/t	**8.9**	**3.1**
Human Health Risk Assessment (GAC)			37	290	350	22	NA	NA	NA	NA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

SPECIATED PAH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-23-13575
Site name: 'The Grove', Openshaw

Prepared by: LT
Authorised by: CB
Proposed land use: Residential with plant uptake
SOM % used: 2.5

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

			PAH's															
Contaminants			Acenapthene	Acenapthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b]flouranthene	Benzo[ghi]perylene	Benzo[k]flouranthene	Chrysene	Dibenzo[ah]anthracene	Flouranthene	Flourene	Indeno[123-cd]pyrene	Napthalene	Pheanthrene	Pyrene	Total PAH's
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
Human Health Risk Assessment (GAC)			510	420	5400	11	2.7	3.3	340	93	22	0.28	560	400	36	5.6	220	1200	NA
Sample Location	Sample Depth (m)	Sample type																	
BH02	0.30	SOIL	**0.02**	< 0.02	**0.03**	**0.2**	**0.21**	**0.24**	**0.16**	**0.1**	**0.23**	**0.03**	**0.34**	< 0.02	**0.15**	**0.03**	**0.17**	**0.31**	**2.22**
BH03	0.70	SOIL	< 0.02	< 0.02	**0.03**	0.07	0.08	0.1	0.06	0.03	0.09	< 0.02	0.15	< 0.02	0.06	< 0.02	0.11	0.14	0.92
Human Health Risk Assessment (GAC)			510	420	5400	11	2.7	3.3	340	93	22	0.28	560	400	36	5.6	220	1200	NA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

SPECIATED TPH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-23-13575
Site name: 'The Grove', Openshaw

Prepared by: LT
Authorised by: CB
Proposed land use: Residential with plant uptake
SOM % used: 2.5

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

			Speciated TPH's														
			Aromatics							Aliphatics							
Contaminants			EC5-7	EC7-8	EC8-10	EC10-12	EC12-16	EC16-21	EC21-35	EC35-44	EC5-6	EC6-8	EC8-10	EC10-12	EC12-16	EC16-35	EC35-44	TOTAL TPH'S
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0	0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0
Human Health Risk Assessment (GAC)			140	290	83	180	330	540	1500	1500	78	230	65	330	2400	92000	92000	NA
Sample Location	Sample Depth (m)	Sample type																
BH02	0.30	SOIL	<10	<10	<10	<1000	<1000	<1000	2820	<10000	109	<10	<10	<1000	<1000	n/t	<1000	3939
BH03	0.70	SOIL	<10	<10	<10	<1000	<1000	<1000	5520	<10000	76	<10	<10	<1000	<1000	n/t	<1000	**7266**
Human Health Risk Assessment (GAC)			140	290	83	180	330	540	1500	1500	78	230	65	330	2400	92000	92000	NA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

BTEX DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-23-13575
Site name: 'The Grove', Openshaw

Prepared by: LT
Authorised by: CB
Proposed land use: Residential with plant uptake
SOM % used: 2.5

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

			BTEX			
Contaminants			Benzene	Toluene	Ethylbenzene	Total Xylenes
Units			µg/kg	µg/kg	µg/kg	µg/kg
Limit of Detection			10	10	10	10
Human Health Risk Assessment (GAC)			0.33	610	350	NA
Sample Location	Sample Depth (m)	Sample type				
BH02	0.30	SOIL	<10.0	<10.0	<10.0	<10.0
BH03	0.70	SOIL	<10.0	<10.0	<10.0	<10.0
Human Health Risk Assessment (GAC)			0.33	610	350	NA

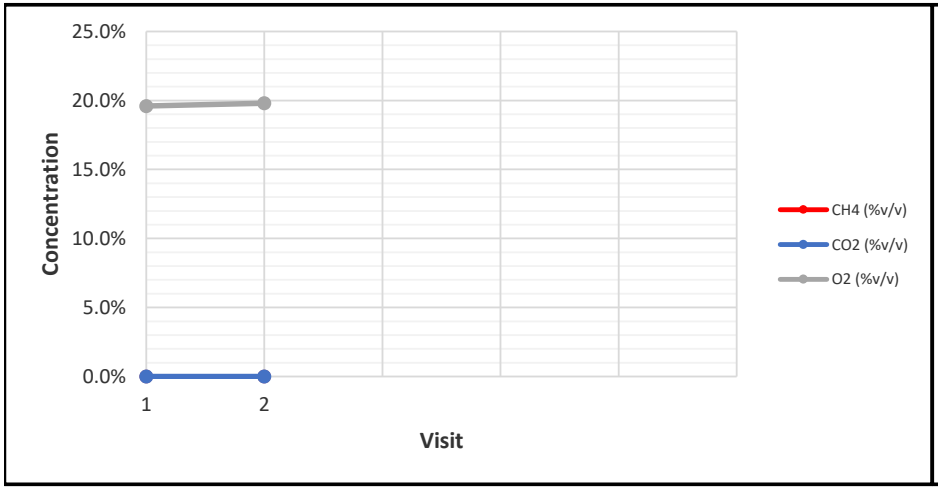
APPENDIX E

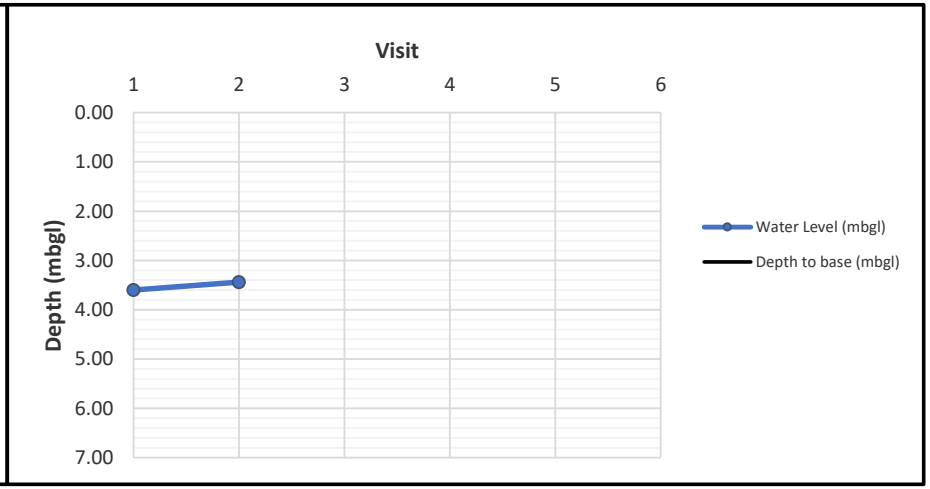
GAS/GROUNDWATER MONITORING DATA

GROUND GAS AND GROUNDWATER MONITORING DATA	CC GEOTECHNICAL LIMITED Consulting Geotechnical and Geoenvironmental Engineers	CCG

Job Number:	CCG-C-23-13575	**Date of Installation:**	11/02/2023
Site:	'The Grove', Openshaw	**Monitoring programme:**	6 visits / 3 Month
Client:	JPJ Investment Property	**Instrument used:**	GFM
Location Reference:	BH01	**Logged by:**	LT
Installation Depth (mbgl):	12.00	**Approved by:**	CB

Visit	Monitoring date	Weather Conditions					Monitoring Data							
		Cloud Cover	Wind Velocity	Precipitation	State of Ground	Atmospheric Pressure (mb)	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Flow Rate (l/hr)	H_2S (ppm)	CO (ppm)	Water Level (mbgl)	Depth to base (mbgl)
1	13/02/2023	OVERCAST	LIGHT BREEZE	DRY	DRY	977	0.0%	0.0%	19.6%	<0.01	0.0	0.0	3.60	12.00
2	13/03/2023	OVERCAST	LIGHT BREEZE	DRY	DRY	1015	0.0%	0.0%	19.8%	<0.01	0.0	0.0	3.44	12.00

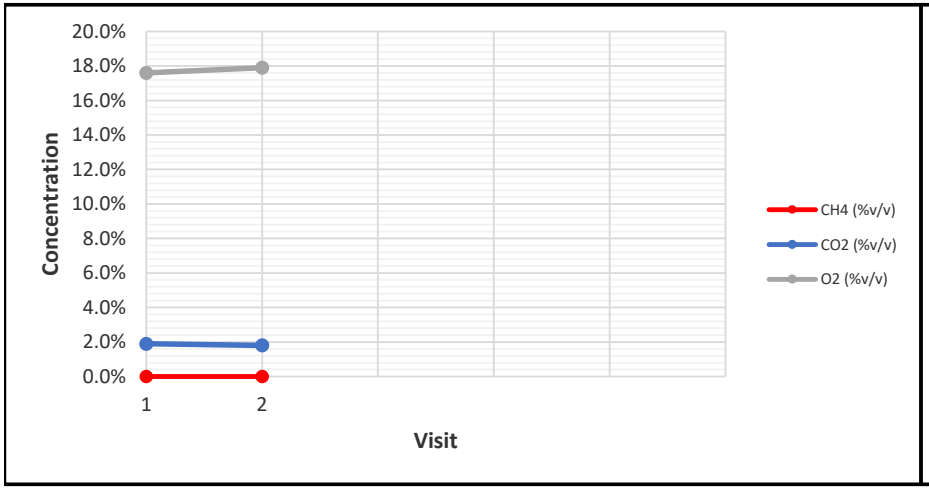


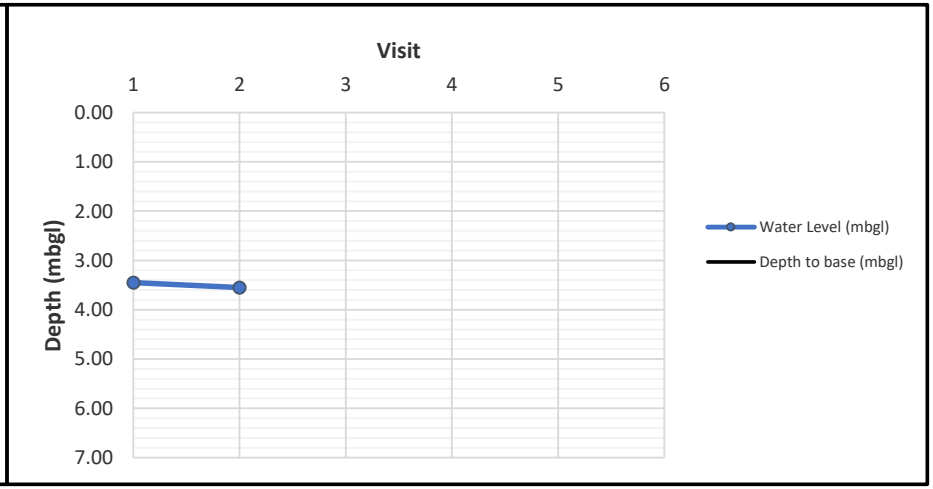


GROUND GAS AND GROUNDWATER MONITORING DATA	CC GEOTECHNICAL LIMITED Consulting Geotechnical and Geoenvironmental Engineers	CCG

Job Number:	CCG-C-23-13575	**Date of Installation:**	11/02/2023
Site:	'The Grove', Openshaw	**Monitoring programme:**	6 visits / 3 Month
Client:	JPJ Investment Property	**Instrument used:**	GFM
Location Reference:	BH02	**Logged by:**	LT
Installation Depth (mbgl):	12.00	**Approved by:**	CB

Visit	Monitoring date	Weather Conditions					Monitoring Data							
		Cloud Cover	Wind Velocity	Precipitation	State of Ground	Atmospheric Pressure (mb)	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Flow Rate (l/hr)	H_2S (ppm)	CO (ppm)	Water Level (mbgl)	Depth to base (mbgl)
1	13/02/2023	OVERCAST	LIGHT BREEZE	DRY	DRY	977	0.0%	1.9%	17.6%	<0.01	0.0	0.0	3.45	12.00
2	13/03/2023	OVERCAST	LIGHT BREEZE	DRY	DRY	1015	0.0%	1.8%	17.9%	<0.01	0.0	0.0	3.55	12.00





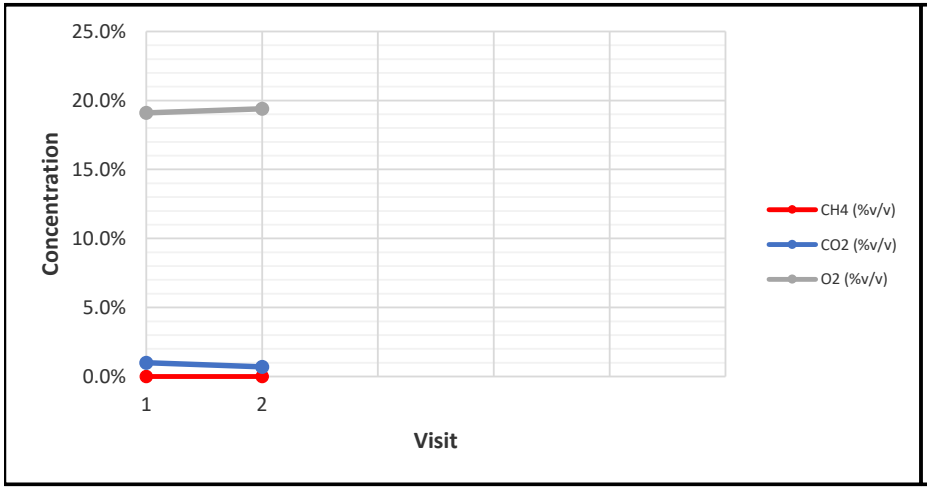
GROUND GAS AND GROUNDWATER MONITORING DATA

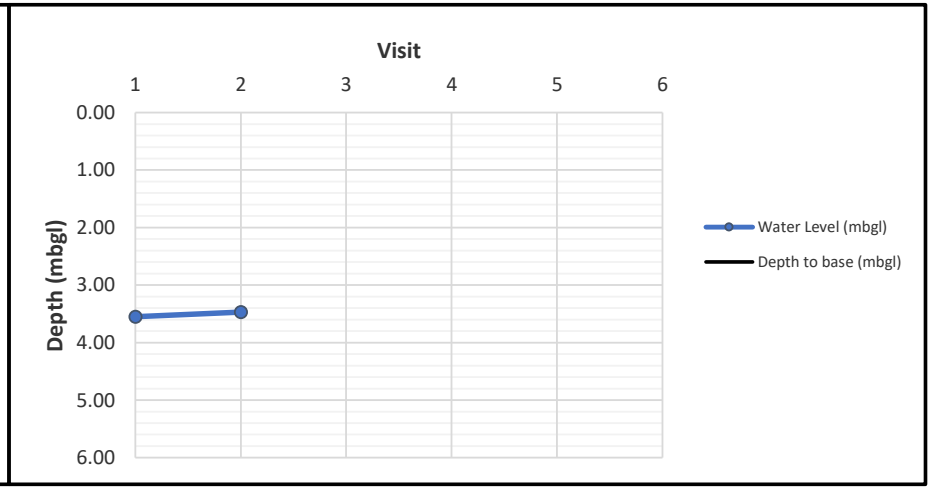
CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

CCG

Job Number:	CCG-C-23-13575	**Date of Installation:**	11/02/2023
Site:	'The Grove', Openshaw	**Monitoring programme:**	6 visits / 3 Month
Client:	JPJ Investment Property	**Instrument used:**	GFM
Location Reference:	BH03	**Logged by:**	LT
Installation Depth (mbgl):	12.00	**Approved by:**	CB

Visit	Monitoring date	Weather Conditions					Monitoring Data							
		Cloud Cover	Wind Velocity	Precipitation	State of Ground	Atmospheric Pressure (mb)	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Flow Rate (l/hr)	H_2S (ppm)	CO (ppm)	Water Level (mbgl)	Depth to base (mbgl)
1	13/02/2023	OVERCAST	LIGHT BREEZE	DRY	DRY	977	0.0%	1.0%	19.1%	<0.01	0.0	0.0	3.55	12.00
2	13/03/2023	OVERCAST	LIGHT BREEZE	DRY	DRY	1015	0.0%	0.7%	19.4%	<0.01	0.0	0.0	3.47	12.00





APPENDIX F

NOTES ON LIMITATIONS

Notes on Limitations
For
Geoenvironmental and Geotechnical Consultancy Services

General

This document has been prepared by CC GEOTECHNICAL LTD within the terms of the contract, scope of work, and resources agreed in writing with the client. The limitations of liability of CC GEOTECHNICAL LTD for the contents of this document have been agreed with the Client, as set out in the terms and conditions of offer and related contract documentation.

This document is intended for the sole use of the client indicated above and CC GEOTECHNICAL LTD accepts no responsibility of whatever nature to third parties to whom this document or any part of this document is made known. Any such party relies upon that information at their own risk.

The findings and opinions provided in this document are made in good faith and are subject to the limitations imposed by employing site assessment methods and techniques, appropriate to the time of investigation and within the limitations and constraints defined in this document.

The findings and opinions are relevant to the dates when the assessment was undertaken, but should not necessarily be relied upon to represent conditions at a substantially later date. In particular, seasonal groundwater levels, with the effects of precipitation, may affect the conditions found during the investigation. The report should be read in conjunction with the further Notes on Limitations included in Appendix A.

Where opinions expressed in this report are based on current available guidance and legislation, no liability can be accepted by CC GEOTECHNICAL LTD for the effects of any future changes to such guidelines and legislation. Additional information, improved practices, new guidance, changes in legislation, or amendments to design proposals, may necessitate this report having to be reviewed in whole or in part after that date. Opinions and interpretations are not accredited by UKAS.

Factual data contained in this report may have been obtained from enquiries with reputable third parties, the results of which are relied on unless indicated to be inaccurate by contradictory information.

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1. the consequences of this document being used for any purpose or project other than for which it was commissioned

and/or

2. the consequences of use of this document by any party with whom an agreement has not been executed.

Phase I Environmental Audits / Desk Studies

The work undertaken to provide the basis of a Phase 1 Desk Study report comprises a study of available documented information from a variety of sources (including the client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in a Desk Study report have been dictated by finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in the report, CC GEOTECHNICAL LTD reserves the right to review such information and to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits

The investigation of the site has been carried out with the intention of providing sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated to potential human targets, building materials, the environment (including adjacent land), and surface and groundwater.

The amount of exploratory work and chemical testing undertaken may have been restricted by the timescale available, and the locations of the exploratory holes may have been restricted to areas unoccupied by the building(s) on the site, and further restricted by the existence of buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For those reasons, if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” of contamination where concentrations may be significantly higher than those actually encountered.

Geoenvironmental Ground Investigations

The investigation of the site has been carried out to provide sufficient information within the agreed scope of the investigation, under the general headings of type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions, to provide a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to the site remediation, these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of the site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.